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PROGRAMED INSTRUCTION AND THE CORRECTION OF WRITTEN LANGUAGE OF ADOLESCENT DEAF STUDENTS.
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SPECIAL PROGRAMS FOR THE DEAF WERE DEVELOPED TO DETERMINE IF GRAMMATICAL ERRORS IN WRITTEN LANGUAGE COULD BE REDUCED. PRELIMINARY ANALYSES WERE MADE ON THE LANGUAGE OF DEAF STUDENTS AND USED AS A GUIDE FOR THE SELECTION OF GRAMMAR MATERIAL TO BE PROGRAMED. ONE CONTROL GROUP AND TWO EXPERIMENTAL GROUPS WERE USED IN THE STUDY. THE SAMPLES CONSISTED OF ADOLESCENT DEAF STUDENTS WHO WERE ASSIGNED TO ONE OF THE THREE GROUPS. EXPERIMENTAL GROUP 1 CONSISTED OF 57 SUBJECTS, EXPERIMENTAL 2, 52, AND THE CONTROL GROUP, 105 SUBJECTS. THE TWO EXPERIMENTAL GROUPS RECEIVED TWO DIFFERENT TREATMENTS, WHILE THE CONTROL GROUP RECEIVED REPRESENTATIVE INSTRUCTION. THE TREATMENTS WERE DIVIDED INTO DEDUCTIVE AND INDUCTIVE FORMS OF PROGRAMS. PROGRAMED LANGUAGE INSTRUCTION IS DEMONSTRABLY EFFECTIVE FOR TEACHING DEAF STUDENTS, PARTICULARLY WHEN COUPLED WITH CONVENTIONAL INSTRUCTION AND USED SKILLFULLY. (JK)

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PROGRAMED INSTRUCTION AND THE CORRECTION OF WRITTEN LANGUAGE OF ADOLESCENT DEAF STUDENTS

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Special Education and Rehabilitation
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Jack W. Birch
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I. INTRODUCTION

A year ago, the investigators reported on a study in which the feasibility of establishing written language through programed instruction was explored (Birch and Stuckless, 1962). The study revealed that programed instruction could facilitate the establishment of language in young deaf children.

Of equal importance is information related to the effect of programed instruction on the language, already established, of adolescent deaf students. Can programed instruction be similarly effective in extinguishing errors? If so, how can programed instruction be most effectively utilized; ie., can the repeated use of language programs be expected to have greater power than the single presentation of such programs?

The following sample of language was written by a deaf adolescent boy. His language is not atypical of the language of many deaf adolescent students and deaf adults.

> "The boys went to ride old car in village. They are name Bobby, Jim, and Rudy. Rudy told two boys come on, go the ride old car the around in village."

The syntactical and morphological errors in the above paragraph markedly interfere with the student's communication. Without doubt, this student has been taught the correct structures. In spite of instruction, errors are established and become resistent to remediation.

Whether such errors would be established if this student had received programed instruction earlier in his development remains unknown. Such information must await longitudinal research. When it is considered that the deaf adult generally has less than satisfactory skill in oral communication, it is obvious that his skill in written language must be developed to the maximum.

The enthusiastic support and cooperation of the administration and faculty of each of the schools participating in this investigation is an indication of general concern about the language development of deaf children and an interest in innovations in instructional methods, such as programed instruction, which might have positive bearing on the linguistic development of deaf children.

II. REVIEW OF LITERATURE

A. Written Language of Deaf

Investigations concerned with the language of deaf children provide evidence that the language of deaf children differs significantly from that of hearing children. Heider and Heider (1940) compared compositions written by deaf and hearing students. They observed fewer compound and complex sentences, a generally simpler writing style, and relatively rigid language units with little overlapping of structure or meaning in compositions written by deaf students.

Walter (1959) studied the written language of deaf students and, in general agreement with Heider and Heider, observed an absence of sentence complexity and a restriction of alternative ways of making a statement.

Myklebust (1960) adapted Thompson's (1936) classification of language errors and arrived at a Syntax Score for evaluating written compositions. Using a Syntax Score, Myklebust reported significant differences favoring hearing children between the ages of seven and fifteen. At age seven, the mean Syntax Score for deaf children was 40.34; for hearing children, 79.57. At age fifteen, the mean Syntax Score for deaf children was 79.93; for hearing children, 98.48. It is remarkable that the scores of fifteen-year-old deaf children approximated those of seven-year-old hearing children. Myklebust also observed that specific errors were made with regularity.

Scouten (1962) has stated that:

> "Because of the structural nature of the methods by which congenitally deaf and 'early-onset' deaf children are taught English, they are extremely proficient in grammar, but are, on the other hand, extremely weak in composition and general language usage (p. 516)."

Scouten attributed inadequacies in composition and general language usage at least in part to the general method of instruction. Simmons (1962) also makes the point that: "Apparently we, as teachers, are more concerned with syntactical correctness than richness of structure or diversity of vocabulary."

Apparently proficiency in grammar and, more specifically, in syntax does not transfer greatly into proficiency in original language. Birch and Stuckless (1963) found 5,044 grammatic errors present in a total of 50,050 words, or approximately one grammatic error per ten words even after many compositions which were unintelligible and could not be readily scored were discarded from the sample.

In spite of evidence of the weakness of the written language of the deaf relative to that of the hearing, written language remains a primary communication medium for the deaf. Lunde and Bigman (1959), surveying the deaf of the United States, sampled 10,101 deaf adults. They found that for communication with employers and peers in occupational settings, 30 per cent of the deaf were dependent exclusively on written language, while another third used written language in combination with other communication media such as speech and manual communication. The dependence upon written language for communication is clear.

Tervoort (1961) gives a possible partial explanation for the inadequacy of the written language of the deaf. As one effect of auditory deprivation, the deaf child has little opportunity to learn correct language without formal instruction. In the meantime he develops his own gross symbol system. Tervoort refers to this system as an esoteric symbol system, an informal, personalized system finding expression largely through gestures. Tervoort (1961) states:

> "In every school the trend to develop esoteric means of communication opposes the educational trend towards speech and lipreading as prerequisites, and straight language usage as final aim (p. 437)."

Conventional language development may be in competition with this esoteric symbol system. Even with advanced language development, the esoteric symbol system may transfer negatively, producing incorrect grammar.

B. Assessment of Language

A major difficulty in studying the communication behavior of deaf children lies in the unavailability of valid, sensitive methods for assessing language. Experimental research on the written language of deaf children can be no more definitive than the instrument used for assessment.

Several objective methods have been developed for the analysis of language. The type-token ratio provides a measure of vocabulary (Johnson, 1944), (Chotlos, 1944), (Templin, 1957). This has been applied by Simmons (1962) to deaf children.

Many investigators have used sentence length as a measure of the complexity of language. McCarthy (1954) has summarized 14 such investigations. Goda (1959) and Myklebust (1960) have applied sentence length as a criterion of language development in deaf children. Williams (1937) derived an index of syntactical structure by assigning a score of 0 to an unintelligible sentence to a score of 4 for a compound-complex sentence. He found a correlation of .80 between length of a sentence and syntactical structure. Templin (1957) similarly employed a point system in evaluating sentences of varying complexity. She used a system adapted by Davis (1937) from McCarthy (1930).* Goda (1959) developed an 11-point scale similar in principle to the 5-point scales used by other investigators.

Templin (1957) described grammatic errors made by hearing children. Thompson (1936) classified such errors as ones of Substitution, Omission, Addition, and Word Order.

One attempt to develop a valid method of assessing the written language of deaf children has been made by Myklebust (personal communication). This method yields a syntax score. Procedures used to arrive at a syntax score have not yet been made generally available. When further information is published on this scoring technique, with information on validity and reliability, it may prove to be an important device for the assessment of grammar.

The various methods employed to analyse and evaluate language do not have immediate application to this investigation since none can now be applied to the criterion of this investigation; namely, frequency of written language errors (syntactical and morphological) with and without programed instruction. It is therefore necessary that a method of language assessment be devised in order to study the effect of programed instruction on errors in the written language of adolescent deaf students.

C. Programed Instruction as a Method of Language Correction

Deaf students receive intensive instruction in language throughout preadolescence and into adolescence. Most principles of language are taught prior to adolescence (Fitzgerald, 1949), (Groht, 1958). Instruction during adolescence consists largely of reinstruction in these same language principles.

Errors become fixed by adolescence and presumably resist extinction. Considerable time is typically given to requiring the student to write compositions which are corrected by the teacher. Most teachers attempt to correct these errors with individual students, but there is usually insufficient time during a class period for such a procedure.

Programed instruction as discussed by Stolurow (1961), Deterline (1962), and Lumsdaine and Glaser (1960) has been repeatedly shown to facilitate learning. Programed instruction represents a teaching technique which commends itself to controlled practice. It follows that the selective application of programed instruction may result in a more efficient and better controlled method of reviewing corrections in language.

Birch and Stuckless (1962) evaluated programed instruction as a means of establishing written language in young deaf children. Children were found to learn selected language in significantly less time than the time required by teachers to teach the same language to an equivalent level by conventional methods of instruction. This investigation was concerned with the initial establishment of language patterns rather than the correction of errors already established. The question remains whether errors in language can be extinguished and the corrections established through programed instruction. If so, will the repeated presentation of specific programs further strengthen the corrections?

Ferster (1960) presented the same programed instruction repeatedly to a group of medical students. He found no increase in learning after the frames had been presented the first time. However, his findings limit themselves to the learning of specific information. This information was of a meaningful nature, requiring full comprehension for mastery. Such information is quite different from information which is void of inherent meaning, eg., learning the sequence of letters comprising the alphabet.

The learning of word and sentence patterns requires rote learning. For example, the "ed" attached to verbs render them past tense, but for an arbitrary rather than a logical reason. Similarly the usual positioning of the verb before the object is learned by rote. The learning of paired-associates as in the acquisition of vocabulary is another example of rote learning.

There is some conflict about the role of repetition in the learning of paired-associates. Rock's (1957) investigation of the effect of repetition supports Ferster even for rote learning. Rock employed paired-associates. He concluded that:"This result suggests that repetition plays no role in the formation (as distinct from the strengthening) of associations."

Lockhead (1961) repeated Rock's experiment but reduced exposure time on each trial. His conclusions were in conflict with those of Rock. In a single prolonged exposure, stated Lockhead, the subject actually repeated or "rehearsed" the pair several times. By reducing exposure time, then, he was better able to control repetition. Under these conditions, learning improved with repetition.

The relative effect of single or repeated presentations of programed instructional materials directed at extinguishing errors in the written language of deaf adolescents remains unknown.

D. Format of Programs

This investigation is primarily concerned with expressive language skill; ie., skill in writing compositions without grammatic errors. The response mode should therefore require written responses in opposition to multiple-choice and/or covert responses. Such a response mode was successfully employed in an earlier investigation (Birch and Stuckless, 1962).

A self-instructional device was employed in this earlier investigation, but with pre-adolescent children. Programed workbooks have the obvious advantage with adolescent students of ease of handling, easier storage, and lower cost.

Homme and Glaser (1959), and Evans, Homme and Glaser (1960) have systematized a procedure for writing and sequencing frames involving verbal learning. They have called this a "Ruleg" system. This system is based upon the assumption that optimum verbal learning follows from deduction, rule followed by example. It remains to be determined whether this deductive approach is superior to an inductive approach (examples leading to a generalization or rule).

Determination of the stronger form of a program, deductive or inductive, is important for the purpose of this investigation, and may have implications for other programs concerned with verbal learning.

III. PROBLEM

Investigations have consistently revealed a high frequency of grammatic errors in the written language of the deaf. Reduction of such errors is crucial to the communication and to the general rehabilitation of the deaf.

Programed instruction has been successfully employed to establish language in preadolescent deaf children. This being so, it was speculated that programs directed against specific grammatic errors could significantly reduce those grammatic errors which recur in the written language of the deaf adolescent.

The problem was to determine whether grammatic errors in the written language of deaf adolescents are reduced through the application of programed instruction under two conditions: when programs are presented once over a five-week period, and presented repeatedly over a six-month period. This investigation would also determine which, if either, is superior to conventional language instruction alone.

In addition, inductive and deductive forms of programs would also be compared with regard to their relative effect on grammar.

Definitions

By grammatic errors is meant syntactical errors, ie., errors in sentence structure, and morphological errors, ie., structural errors in words.

For the purpose of this investigation, programs refer to ten linear workbooks developed according to the general principles of learning utilized in programed instruction, and each designed to remedy a specific grammatic error observed in the written language of the deaf.

A deductive format refers to a sequence of frames wherein a generalization, ie., a rule, is followed immediately by examples of the application of that generalization. An inductive format refers to the reverse of this order.

The following hypotheses were advanced with the condition that the programed instruction presented to the experimental groups was additional to, and not a substitute for, ongoing conventional instruction. It was hypothesized that:

1. a single presentation of programs would have no effect on the grammar of deaf adolescents.

2. repeated presentations of programs would have a superior effect on the grammar of deaf adolescents to a single presentation or conventional instruction alone.

3. there would be no difference between the influence of two programs, one employing a deductive format, the other employing an inductive format, on the grammar of deaf adolescents.

This investigation would also permit (a) the development and evaluation of an objective scoring procedure for the assessment of grammar in the written language of deaf students, (b) a description of grammatic errors of deaf students, and (c) a cursory examination of the relationships between grammatic errors and other variables associated with deaf students.

IV. PROCEDURE

A. Development of Programs

Special programs were developed for this investigation in spite of the fact that numerous programs have been published for instruction in grammar. These programs have been developed for students without hearing loss. There are two chief objections to the use of these programs for deaf students: (a) the instructional content and vocabulary are considerably too advanced for the typical deaf student; (b) many of the errors which are commonly made by deaf students are made much less frequently by hearing students.

For these reasons, it was considered advisable to develop a series of programs specially for this investigation. It would first be necessary, however, to determine the errors most in need of correction.

1. Preliminary Analysis of Language - Preparatory to the selection of ten principles of grammar for programing, two analyses of the written language of deaf students were conducted. The first was planned to yield information on the relative frequency with which parts of speech are used by deaf adolescent students. A random sample of 97 compositions was selected from a total of 362 compositions written by adolescent deaf students in an oral residential school,[1] a combined residential school,[2] and an oral day

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[1] A school in which deaf students reside during the school year and in which instruction is given without recourse to manual communication.

[2] A residential school which encourages the use of speech and manual communication for instructional purposes.

school.[1] Sixteen compositions were discarded from an original 378 compositions because of their unintelligibility.

A total of 13,374 words were classified in terms of conventional parts of speech. This yielded a count of the frequency with which various parts of speech were used in this sample.

The total of 362 intelligible compositions were then examined for grammatic errors.

The data from these preliminary analyses were used as a guide to the selection of ten aspects of grammar to be programed. No assumptions were made about the validity or reliability of these analyses. Final judgment as to the selection of the ten categories for programing was made on the basis of: (a) frequency with which specific grammatic errors were made; (b) suitability for programing; (c) a consideration of their importance in a sentence.

An improved method of analysis of errors was later developed coincidental to the testing of the hypotheses (Appendix C).

2. General Description of Programs - The following ten categories were selected for programing (Appendix A):

a. verb tense
b. verb agreement
c. "to be" and "to have"
d. subject and verb omission
e. auxiliary verbs
f. infinitives
g. articles

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[1] A school to which students commute from home daily and which excludes manual communication from the classroom.

h. prepositions

i. conjunctions

j. noun number

The following principles were applied in the selection of the content of each program: (a) An effort was made to keep the reading grade level of vocabulary low enough that it was likely to be known to most deaf adolescents; (b) The content followed from errors observed frequently. For example, the irregular verbs introduced in the program "verb tense" were selected specifically because these verbs were frequently employed in the compositions analysed; (c) The rules of grammar attempted, where possible, to provide the student with clues for correct usage. For example, a rule in the program "verb agreement" stated that for the present tense, "usually, if the noun does not end in 's', the verb ends in 's'." Such a rule was utilized rather than "add 's' to verbs in the third person singular." The latter rule would not have provided cues as the former rule did. (d) Each program consisted of rules and examples.

The programs ranged from 40 to 67 frames, each program under separate cover. Each program was linear in design (Appendix D). Written responses were required for each frame, some a single word; others a full sentence. Responses were written on a separate sheet of paper so the programs would not be expended.

3. Inductive and Deductive Forms - Two forms of each program were developed. These forms differed in that one form utilized an inductive format, whereas the other form was deductive.

The deductive form was developed first. For each workbook, the general rules were written. Each rule was followed by as many examples as were considered necessary to illustrate important applications of that rule.

To develop each inductive form, the rules written for the deductive form were positioned after the examples. Minor changes were made in the example frames. It was necessary to build cues into these frames. This was unnecessary with the deductive forms where the rules themselves served as cues. The deductive programs showed this immediate advantage.

4. Preliminary Testing of Programs - Each of the programs was pretested on ten adolescent deaf students. They were then revised and retested on the same group of students. Retesting of the same students was justified on the basis that during the experimental period, programs would be repeatedly presented to the same students.

Mean time for the completion of each program was 21 minutes. The percentage of frames on which students made errors varied, after program revision, between .9 per cent on the program "noun number," and 6.3 per cent on the program "articles."

B. Subjects

The sample used in the experimental phase of this investigation was drawn from seven schools for deaf children. The programs and the sample selected for the investigation are as follows:

Table 1. Information on schools for the deaf selected for experimental phase of investigation[1]

School	Location	Identification	Total Number of students
A. G. Bell	Cleveland	day	157
American	Hartford	residential	376
W. & E. Martin	Philadelphia	day	202
Bruce Street (and outside classes)	Newark	day	149
Michigan	Flint	residential	408
Pennsylvania	Philadelphia	residential	499
W. Pennsylvania	Pittsburgh	residential	429

The chief administrator of each school was requested to submit the names of all the students in the five oldest classes in each school. Special classes of mentally retarded students were to be excluded. Each class was to have a mean age of at least thirteen years. In schools which had less than five classes meeting these criteria, a number less than five classes was to be submitted. Since most classes of deaf students do not exceed ten students, it was anticipated that the groups comprising the total sample would be 350 students or less.

1. Experimental and Control Groups - Two experimental groups and one control group were used in the experiment. In order to avoid contamination, it was decided that intact groups be used, with the sample from each school being assigned to one of the three groups. The students from three schools were designated as a control group, with two schools contributing one experimental group,

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[1] Reported in January, 1963, in American Annals of the Deaf.

and the two remaining schools comprising the second experimental group. A day school was represented in each of the three groups.

Table 2. Description of three groups upon which results were based[1]

Group	No.	Mean Age	Sex	Day-Res	Hearing Impairment[2]
Control	105	17 yrs. 0 mos.	49 m. 56 f.	26 day 79 res.	79 db.
Exper. I	57	16 yrs. 6 mos.	31 m. 26 f.	25 day 32 res.	74 db.
Exper. II	52	17 yrs. 6 mos.	27 m. 25 f.	19 day. 33 res.	82 db.
Total	214				

2. Deductive and Inductive Subgroups - Experimental groups I and II were each randomly divided into two subgroups, one to receive deductive forms of the programs exclusively; the other to receive inductive forms of the programs exclusively.

Only experimental group II, the group to receive repeated presentations of the programs, would be used to test the relative effect of the two forms. This experimental group was selected since any differences revealed between the two forms would be most likely to appear under the condition of repeated presentations. Half of experimental group I was given each form so that the two experimental presentations would remain directly comparable.

Table 3 describes the two subgroups of experimental group II which received the deductive and inductive forms of the programs.

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[1] The method of statistical analysis would make it unnecessary for the three groups to be equated on the above variables.

[2] Mean decibel loss at 500, 1000, 2000 cps. in better ear, by pure tone air conduction.

Table 3. Description of deductive and inductive subgroups[1] of experimental group II

Group	No.	Mean Age	Sex	Day-Res.	Hearing Imp.
Deductive	26	17 yrs. 6 mos.	10 m. 16 f.	8 day 18 res.	78
Inductive	26	17 yrs. 6 mos.	17 m. 9 f.	11 day 15 res.	86
Total	52				

[1] Table of random numbers was used for placement in two subgroups.

C. The Experiment

Meetings were held with administrators and seven teachers responsible for the language instruction of students in the two experimental groups. These meetings were conducted for the purpose of explaining the conditions under which the programs should be presented. In addition, detailed written directions were given each participating teacher.

1. Control Group - This group was required for the purpose of serving as a control with which the experimental presentations would be compared. No controls were exercised over the methods of language instruction used with this group. This group consisted of a sample from two residential schools and a day school. It was considered that the instruction would be relatively representative.

2. Experimental Group I - Experimental group I was established to determine the effect of a single presentation of each of the ten language programs over a five-week period, on grammatic errors, and to determine whether the effect, if any, remained after six months.

The following procedure was followed for five weeks:

a. Monday evening the student wrote a composition of his choosing.

b. Tuesday evening the teacher checked the composition for errors in grammar. The teacher selected and underlined two different errors for which programs were available.

c. Wednesday and Thursday evenings the student completed programs, and attempted the corrections in his composition based on information conveyed in the programs.

d. Friday the student returned to the teacher his composition, the programs, and the paper on which he made his written responses.

It is apparent that over a five-week period, some of the ten errors under investigation might not appear in the compositions of a particular student.[1] The teacher was then required to present the remaining programs without reference to errors in the composition.

This practice ensured that the students of experimental group I, except for extended absence, would be presented with all ten programs over the five-week period.

Following the initial five-week period, students of experimental group I were given conventional instruction in language and received no further programed instruction.

3. Experimental Group II - A second experimental group was established for the purpose of determining the effect on grammatic errors of repeated presentations of programs over a six-month period.

Programs were presented to the members of experimental group II at the rate of two per week over a six-month period. The weekly procedure followed by this group was similar to that followed for experimental group I with the exception that the two programs assigned each week were directly contingent upon the first two errors in the composition for which programs had been prepared. No effort was made to ensure that every program would be presented over the six-month period. Selection of the programs for presentation was determined by the nature of errors made by the student. A student who repeatedly made the same error in the first two errors in his composition on succeeding weeks, would be presented with the same program. It was conceivable that a student might be required to complete the same program each week for up to six months.

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[1] It was later determined that 73 per cent of the programs administered to experimental group I followed directly from an observation of the ten errors.

4. Important Considerations - Attention is drawn to the following facts:

a. The inspection of compositions by the participating teachers, and the programed instruction taken by students, were conducted outside of regular school hours so that no interference with the ongoing classroom activities was involved.

b. For experimental group II and, where possible, for experimental group I, the programed instruction received by each student was adapted to his particular language errors. While each program was linear, its selective use increased its adaptability.

c. It is stressed that the programed instruction received by experimental group I and by experimental group II was additional to, and not a substitute for, ongoing conventional instruction. Any improvement in grammar produced in the experimental groups must be considered a function of the combined effect of conventional and programed instruction. Only by comparing these groups with the control group could the independent variable of programed instruction be isolated. The design of the investigation accommodated this.

D. Evaluation of Effects

Two independent criteria were established for the evaluation of the relative effects of single and repeated program presentations and inductive-deductive forms.

1. Grammar Test - The first criterion consisted of a test of the correct application of the grammar principles conveyed in the ten programs (Appendix B).

This test consisted of two parts. The first part contained ten sections, each related to one of the ten principles of grammar selected for programing. Nine of the ten sections contained five elliptical or incomplete sentences. The student added the article, preposition, etc., without which the sentence was incomplete. The tenth section required the student to identify the verbs in five sentences.

The second part consisted of two paragraphs. Each paragraph contained ten grammatic errors, some of omission (necessary word deleted), some of substitution (wrong word substituted).

A perfect grammar test score was 70 points, 50 on the first part and 20 on the second part. The same test was administered to the three groups at the beginning of the six-month period, five weeks later, and a third time at the completion of the six-month period. All groups were administered the test at the end of the five-week period so each would have equal exposure to it.

2. Inspection of Compositions - It has been stated in the review of literature that no satisfactory technique has yet been devised for the assessment of the grammar of deaf adolescents through the direct inspection of their language. The terminal behavior sought of deaf students after receiving the programs is improvement in

grammar. The value of the programs is contingent upon the transfer of learning from the programs into reduced errors in language.

It was evident that if a valid instrument was to be used to evaluate language directly, it must be developed during the course of this investigation.

It was also evident that it might not be possible to devise an instrument with the necessary validity and reliability and hence the other criterion of the grammar test score. Grammatic errors in compositions written by deaf adolescents are difficult to classify. The error can often only be classified by inspecting the language surrounding it. The adjacent language often provides a cue as to the error. When multiple errors occur in the same sentence, the surrounding words lose their cue value.

It was necessary to establish a large number of rules to cover the count and classification of errors. These rules permitted the scoring of the compositions with relative consistency. Compositions which could not be scored because of unintelligibility, for instance, were arbitrarily considered to have an error count of 50 per cent of the total words. Other questions arose about how to score errors such as "we swim over water, swim water, we swim and water." On the point of how to score the preposition, it was decided that substitution of the wrong word but the same part of speech should constitute a single error, that omission of the preposition should similarly be scored as a single error, but that substitution of the wrong word which happens also to be an inappropriate part of speech should constitute two errors.

Grammatic errors were classified as one of 31 discrete kinds (Appendix C) under seven main headings as follows: verbs, articles, prepositions, conjunctions, nouns and pronouns, word order and meaning, unclassified.

Applying the rules for scoring (Appendix C), a total error count was derived for each composition. The number of words in the composition was totaled and the composition score expressed as the number of errors per 100 words. A high composition score was therefore inversely related to grammatic correctness.

Three compositions were collected from each group for scoring. Teachers collected these compositions and forwarded them, uncorrected, to the investigators. These compositions were written in late October, five weeks later, and again the following April by the three groups. Where compositions were written in connection with the weekly procedure described under "C. The Experiment, 2. Experimental Group I," these were used as the criterion.

E. Grammatic Errors and Other Variables

The development of a procedure for scoring compositions directly also permitted a description of specific grammatic errors and their relative frequency of occurrence. Errors in the first 214 compositions written by the 214 students in the three groups were counted and classified according to the scoring procedure (Appendix C).

In addition to the criterion data (grammar test scores and composition scores) the following information was collected on each of the 214 students:

a. age in months as of October, 1962 (the month when the criterion data were first collected).

b. student's age in years when deafness was first recognized by parents.

c. severity of hearing impairment, decibel loss in the better ear at 500, 1000, and 2000 cycles per second, by pure tone air conduction audiometry (most recent test administered by the school).

d. intelligence quotient[1] (most recent test of mental ability which had been conducted by the school was used).

e. reading grade achievement level[1] as of June, 1962.

f. language grade achievement level[1] as of June, 1962.

g. overall grade achievement level[1] as of June, 1962.

F. Methods of Statistical Analysis

The retest reliabilities of the two criteria (grammar test scores and composition scores) were determined. Coefficients of stability were derived from grammar test scores and composition scores before and after the first five-week period, based on the 214 students in the three groups.

A single scorer was used to arrive at composition scores. The reliability of scores provided by a single scorer was also determined (Ebel, 1951). Twenty compositions were randomly selected and scored independently by two scorers equally acquainted with the scoring procedure. Variances for the estimate of reliability of scores from two independent scorers were computed, and the reliability directly derived.

The relationship between grammar test scores and composition scores was established by means of a Pearson Product-Moment coefficient on the 214 pairs of scores at the beginning of the six-month experimental period.

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[1] I.Q. scores and grade achievement levels were taken from school records. Since different schools employ different tests, considerable reliability was lost. Special testing by the investigators was not considered warranted because of the secondary significance of this data to the investigation.

To test the hypothesis that a single presentation of programs would have no effect on the written language of deaf adolescents, repeated measurements were employed. Grammar test scores and composition scores were available on each student in experimental group I from before and after the five-week period during which each of the ten programs was presented once.

Two independent analyses of variance, one for each criterion, were employed to test this hypothesis. Residual sums of squares were computed in each analysis to accommodate the interaction component between subject and trial in the repeated measurements analysis.

Two analyses of covariance comparing the adjusted grammar test scores and composition scores of experimental group I, experimental group II, and the control group were used to test the hypothesis that the repeated presentation of programs produced greater learning than the single presentation or conventional instruction alone. The three groups had been assigned grammar test scores and composition scores when they took the grammar test and wrote compositions at the beginning of the six-month experimental period. These scores reflected the initial performance of the three groups, expected to correlate positively with final scores. They would accordingly be used as the covariate to be used for adjusting the means of the two criterion scores derived from the grammar test and compositions collected and scored after six months.

Adjusted means would be calculated and, if necessary, further analyses conducted.

It might be argued that additional covariates such as severity of hearing impairment, age, etc., would have contributed to better adjusted criteria. However, if these variables are related to the criteria, they should also be inherent in the grammar scores and composition scores used as the covariates in the two analyses.

Experimental group II was selected to compare the relative amount of learning from the two forms of each program, the inductive and the deductive forms. Experimental group II was selected because it was hypothesized that the greatest effect of programed instruction would be present among the group which received the repeated presentations.

Since the two forms had been randomly assigned among this group, a simple two-part analysis of variance upon scores at the end of the six-month experimental period was possible. Two analyses were conducted, one covering grammar test scores, the other, composition scores.

Grammatic errors were classified according to the scoring procedure (Appendix C) under 31 classes, and described as percentage of total errors.

Correlation coefficients were derived to determine whether significant relationships existed (a) between grammar test scores at the beginning of the experimental period and the seven descriptive variables, and (b) between composition scores at the beginning of the experimental period and the same seven descriptive variables.

F ratios and correlation coefficients were tested for significance at the 5 and 1 per cent confidence levels.

V. RESULTS

A. Estimates of Reliability

It is necessary that the stability of the two criterion measures be known in order to evaluate the results, particularly since each hypothesis was tested on the two independent criteria. The coefficient of stability for the grammar test over a five-week test-retest period was .89, and for the scores derived from direct inspection of compositions, .57.[1] The stability of the grammar test criterion is seen to be substantially higher than that of the composition criterion.

The reliability of scores on compositions as derived by a single scorer was found to be .95. This high reliability coefficient indicated that little subjective judgment entered into the derivation of the composition scores, and that reliability would have been increased by very little if two or more scorers had been used instead of just one.

The coefficient of correlation between test scores and composition scores of the 214 students at the beginning of the six-month experimental period, actually an indication of concurrent validity, was -.60 (the negative relationship due to the fact that a high composition score indicated many grammatic errors in a composition).

B. Mean Test and Composition Scores

Mean grammar test scores for the three groups are shown in Table 4. Test results at the beginning and end of the six-month experimental period are reported for the three groups. In addition, scores at the end of the first five weeks are reported for experimental group I.

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[1] This coefficient might have been higher if one group had been used instead of the three.

Table 4. Mean grammar test scores for three groups

Group	First Test	Five Wks.	Six Mos.
Control Mean Score	46.0		49.0
Exper. I Mean Score (single pres.)	47.6	48.9	50.7
Exper. II Mean Score (repeated pres.)	41.3		46.0

It is noted that the mean test scores of the three groups at the beginning of the six-month period are considerably different. This difference was tested for significance by a simple analysis of variance. The resulting F ratio of 3.33 was significant at the 5 per cent level of confidence, with a significant gap between experimental group II and the other two groups, indicating that the three groups were not equated as to initial level of test performance, and that the initial level of test performance of experimental group II was below that of the other two groups.

An analysis of variance of scores at the end of the six-month period produced an F ratio of 2.03, not significant at the 5 per cent level of confidence.

Mean composition scores[1] for the three groups are shown in Table 5. Composition scores at the beginning and end of the six-month experimental period are reported for the three groups, with scores at the end of the first five weeks also reported for experimental group I. The percentage increase or decrease in errors over six months is also shown.

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[1] Attention is again drawn to the fact that a high score reflected a high percentage of grammatic errors to total words in the composition.

Table 5. Mean composition scores for three groups

Group	First Comp.	Five Wks.	Six Mos.	Increase or decrease in errors over six mos.
Control Mean	17.1		19.3	+ 12.9%
Experimental I Mean	17.3	15.0	15.6	- 9.8%
Experimental II Mean	23.8		18.7	- 21.4%
Total Mean	18.9			

As was noted with the grammar test scores of the three groups, grammatic errors on the first composition appear to have been made considerably more frequently by experimental group II than by experimental group I or the control group. This difference was tested for significance by means of analysis of variance. An F ratio of 5.01 was significant at the 1 per cent level of confidence. Experimental group II made significantly more errors. An F ratio of 1.74 resulting from an analysis of variance of the composition scores of the three groups at the end of the six-month period revealed no significant difference in performance among the three groups at the end of the six-month period.

These two independent analyses, based on the two criteria, support each other. Experimental group II was significantly poorer in skill in grammar at the outset of the six-month experimental period. At the end of this period, no statistically significant difference was evident among the three groups.

C. Effect of Single Program Presentations

It had been hypothesized that a single presentation of programs would have no effect on the grammar of deaf adolescents.

Table 6 and Table 7 show the results of two independent three-part analyses of variance of test scores and of composition scores before and after five weeks during which each of the ten programs was presented once to experimental group I.

Table 6. Three-part analysis of variance of grammar test scores of experimental group I which received a single presentation of ten programs over five-week period

Source of variation	Sum of squares	df	Mean square	F
Between tests	50.67	1	50.67	N.S.
Between subjects	20650.11	56	368.75	
Residual	1003.33	56	17.91	
Total	21704.11	113		

No statistically significant difference in test performance was found over a five-week period as a consequence of a single presentation of the programs.

Table 7. Three-part analysis of variance of composition scores of experimental group I over five-week period

Source of variation	Sum of squares	df	Mean square	F
Between compositions	162.24	1	162.24	N.S.
Between subjects	15605.66	56	278.67	
Residual	3489.26	56	62.30	
Total	19257.16	113		

No statistically significant difference in the percentage of grammatic errors in compositions was found over a five-week period as a consequence of a single presentation of the programs.

The results of both analyses lead to acceptance of the hypothesis that the single presentation of the ten grammar programs would have no effect on the grammar of deaf adolescents.

D. Effect of Repeated Program Presentations

It had been hypothesized that the repeated presentation of programs would have a superior effect on the grammar of deaf adolescents to a single presentation or conventional instruction alone.

It has been shown that initial skill in the use of grammar was not equal among the three groups. It was therefore necessary to statistically control for initial skill among the three groups.

An analysis of covariance was conducted upon the grammar test scores obtained after the six-month experimental period for the three groups. Test scores at the beginning of the six-month period were used as the covariate. Table 8 shows the results of this analysis.

Table 8. Analysis of covariance of grammar test scores of three groups after six-month experimental period

Source of variation	Sum of squares of errors of estimate	df	Mean Square	F
Total	360.59	212		
Within groups	301.62	210	1.43	
Adjusted means	58.97	2	29.48	20.61*

*Significant at the 1 per cent level of confidence

The adjusted mean grammar test scores at the end of the six-month experimental period were: control group, 48.36; experimental group I, 48.53; experimental group II, 49.77. The significant gap was that between experimental group II and the other two groups, there being no statistically significant difference between adjusted final scores of the control group and experimental group I. A supplementary analysis of covariance was conducted between experimental group I and experimental group II, producing an F ratio of 7.76, significant at the 1 per cent level of confidence.

This analysis leads to rejection of the statistical null hypothesis and acceptance of the hypothesis that the repeated presentation of programs produces greater skill in the use of grammar than the single presentation or conventional instruction alone.

A second analysis of covariance was conducted on the composition scores of the three groups after the six-month experimental period, with composition scores at the beginning of the six-month period serving as the covariate. Table 9 reveals the result of this analysis.

Table 9. Analysis of covariance of composition scores of three groups after six-month experimental period

Source of variation	Sum of squares of errors of estimate	df	Mean square	F
Total	23699.33	212		
Within groups	22938.75	210	109.23	
Adjusted means	760.58	2	361.79	3.31*

*Significant at the 5 per cent level of confidence.

This table reveals that differences among the three groups were present which could not be wholly attributed to initial differences before the six-month experimental period.

The adjusted mean composition score on the compositions after the six-month experimental period for the control group was 20.1; for experimental group I, 16.3; and for experimental group II, 16.3. It was apparent that a significant difference was between the control group and the combined experimental groups. The two experimental treatments were superior to the conventional treatment.

The two independent analyses each provide evidence that the use of programed instruction is superior to conventional instruction alone. The analysis based on grammar test scores reveals superiority of the repeated presentation of programs, while the analysis based on composition scores indicates general superiority of programed instruction, but no discrimination between the effect of the single versus repeated presentation of programs.

One analysis supports the hypothesis of superiority of the repeated presentation of programs over the single presentation or conventional instruction alone. The second analysis does not support this hypothesis. Considerable attention will be given this phenomenon in the discussion to follow later.

E. Deductive and Inductive Forms

The comparison of the relative effect of the deductive and inductive forms of the ten programs on grammar was based upon results of the grammar test and of the scoring procedure for compositions. Experimental group II was used as the sample to evaluate the two forms. Experimental group II was selected since it had been hypothesized that the greatest gains would be made by this group. It should follow that relative differences in learning produced by the two forms would be most evident among this group.

It was hypothesized that there would be no difference between the influence of the two forms, one deductive, the other inductive. Table 10 and Table 11 show the results of the analyses of variance between the students who regularly received the deductive form over the six-month experimental period, and students who received the inductive form over the same period.

Table 10. Analysis of variance of grammar scores for sub-groups receiving deductive and inductive forms

Source of variation	Sum of squares	df	Mean square	F
Between subgroups	94.23	1	94.23	N.S.
Within subgroups	5441.70	50	108.83	
Total	5535.93			

Table 11. Analysis of variance of composition scores for sub-groups receiving deductive and inductive forms

Source of variation	Sum of squares	df	Mean square	F
Between subgroups	111.07	1	111.07	N.S.
Within subgroups	2490.01	50	49.80	
Total	2601.08	51		

Neither analysis revealed a statistically significant difference between scores as a result of being presented deductive or inductive programs. The null hypothesis was accepted.

F. Classification of Grammatic Errors

Table 12 shows the distribution of errors, by percentage of total grammatic errors, revealed in the 214 compositions written at the beginning of the experimental period. The scoring procedure (Appendix C) was used to classify errors.

Table 12. Grammatic errors in compositions of 214 students

Classification	% of errors	Classification	% of errors
1. Verbs		4. Conjunctions	
a. tense	8.6	a. addition	2.7
b. agreement	1.0	b. substitution	.5
c. omission	1.8	c. omission	2.2
d. addition	1.4	Subtotal	5.4
e. be-have	.6		
f. voice	1.1	5. Nouns and pronouns	
g. auxiliary	1.7	a. common noun no.	5.1
h. infinitive	1.7	b. irregular noun no.	.1
i. verbal	1.3	c. omission noun, pro.	3.4
j. negative	0.0	d. addition, noun, pro.	3.3
k. conjugation	1.0	e. pro. substitution	1.2
Subtotal	20.3	f. possess.	1.6
		Subtotal	14.7
2. Articles			
a. substitution	1.8	6. Order-meaning	
b. omission	7.6	a. single word	1.5
c. addition	2.8	b. phrase	.3
d. an-a	.1	c. clause	31.0
Subtotal	12.3	Subtotal	32.8
3. Prepositions		7. Unclassified	5.2
a. substitution	2.8		
b. omission	3.5		
c. addition	3.0		
Subtotal	9.3		

G. Skill in the Use of Grammar and Other Variables

Grammar test scores and composition scores received by the 214 students of the three groups at the beginning of the six-month period were tested for correlation with seven variables enumerated in Table 13.

Table 13. Correlation coefficients of seven variables with grammar test scores and composition scores

Variable	Correlation with grammar test scores	Correlation with composition scores
1. Age in months	.200**	-.104
2. Age at onset of deafness	.071	-.137*
3. Severity of hearing loss (decibels)	.021	.044
4. Intelligence quotient	.361**	-.267**
5. Reading achievement	.679**	-.517**
6. Language achievement	.722**	-.470**
7. Overall achievement level	.708**	-.467**

*Significant at the 5 per cent level of confidence

**Significant at the 1 per cent level of confidence

Intelligence quotients and grade achievement levels in (a) reading, (b) language, and (c) overall achievement correlated positively with grammar test scores and correlated negatively with composition scores (significant at the 1 per cent level of confidence). Coefficients would probably have been higher had the same tests of intelligence and achievement been administered to all 214 students.

Composition scores correlated negatively with age at onset of deafness (significant at the 5 per cent level of confidence).

Grammar test scores correlated positively with age in months (significant at the 1 per cent level of confidence).

VI. DISCUSSION

A. Interpretation of Results

1. Reliability of Two Criteria - Coefficients of stability were determined for the two criteria with the period of five weeks intervening between test-retest. The three groups were used for these tests of stability. It might be argued that the intervening various treatment effects for the three groups would tend to reduce the coefficient when based on the three groups. However, it has been shown that the treatment effect of programed instruction over this period did not significantly alter either grammar test scores or composition scores for experimental group I. The difference in treatment for the groups over the five-week period may be discounted, so for practical purposes, a single coefficient of stability could be based on the total of 214 students.

Grammar test scores were found to be highly stable over the five-week period (r=.89), but composition scores were relatively unstable over the same period (r=.57).

One major type of error responsible for low reliability of the composition scores could follow from the dependence of the scorer on his judgment, introducing subjectivity. However, the reliability of the single scorer was considered to be high, the reliability coefficient being .95. No practical purpose would have been served by increasing the number of scorers.

Another major error could contribute to unreliability of the composition scores. Variations in the number of grammatic errors in the composition may be a function of the kind of composition written. A student might make significantly fewer errors in writing a descriptive composition than in writing a narrative composition. This source of unreliability of an estimate of skill in the correct use of grammar should have been controlled.

Interpretation of these data force the decision to place greater confidence in the grammar test than the results of direct inspection of compositions. The latter will be discussed in greater detail under "Recommendations for Further Research."

2. Trends Over Six-Month Period - Mean grammar test scores after the six-month period (Table 4) showed a trend upward for each of the three groups over the six-month period. This might be expected as a direct result of students having received the same test three times. It was noted that the three groups differed in initial level of performance, with considerably poorer test performance evident in experimental group II. At the end of the six-month period, the differences among the scores of the three groups were not statistically significant. The standard deviation of the 214 scores was noted to be less after six months (S.D., 12.26) than at the beginning of the experimental period (S.D., 13.50).

Table 5 disclosed several unexpected trends with regard to composition scores over the six-month period. Errors were reduced in experimental group II by 21.4 per cent[1] while errors increased in the control group by 12.9 per cent.[2]

Unless one is prepared to conclude that grammatic errors in compositions increase over six months of conventional instruction alone, this increase in apparent errors must be due to instability of the criterion. The latter is much more plausible and reinforces the evidence about the poor reliability of the composition scores.

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[1] Significant at the 1 per cent level of confidence.

[2] Significant at the 5 per cent level of confidence.

3. Effects of Single and Repeated Program Presentations - No significant improvement in grammar test scores resulted from the single presentation of each of the ten programs over a five-week period. This finding supports the original hypothesis.

Repeated program presentations resulted in performance superior to that produced by a single presentation or conventional instruction alone, as revealed by grammar test scores.

This finding is in conflict with the result of the analysis upon composition scores. The latter analysis revealed the effects of the two experimental treatments to be equivalent, but both to be superior to conventional instruction alone. However, confidence in this finding is lacking because of the demonstrated instability of the composition scores. Conclusions are therefore based on grammar test scores.

The hypothesis that the repeated presentations of programs will result in performance superior to the single presentation of programs or conventional instruction alone, is accepted.

This investigation disclosed that programed instruction can effectively increase the skill of deaf adolescents in the application of principles of grammar.[1] However, programed instruction must be presented repeatedly in order to be effective. Presumably, grammatic errors have become so fixed within the language of deaf adolescents that they resist extinction under remedial programed instruction unless programs are presented repeatedly.

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[1] Note that it is not asserted that grammatic errors in compositions are significantly reduced.

It follows that learning (either establishment of a response or strengthening of a response) takes place on presentations which follow the first presentation, even though each presentation is identical. The type of material to be learned is obviously a relevant variable. One investigation cited in the literature (Ferster, 1960) revealed that maximum learning took place with the first presentation and that subsequent presentations of the same program produced no measurable increase in learning. The subject material upon which the program content is based evidently determines the feasibility of presenting the same program repeatedly to the student. The material programed for this investigation required rote learning.

4. Deductive and Inductive Forms - No significant difference was found between the learning which took place as a consequence of the deductive and inductive forms of the ten programs. The original hypothesis is thereby accepted.

It is possible that the rules in the programs contributed little to learning and that students profited primarily from the examples, using these examples to generate their own generalizations instead of relating the examples to the principles given in the programs. If such were the case, the relative position of rules and examples would be unimportant.

The deductive forms were somewhat easier for the programers to develop than the inductive forms, since the rules themselves served as cues.

5. Anecdotal Information - Conferences were held with several teachers and classes participating as members of the two experimental groups.

Teachers were generally favorably disposed toward the programs, particularly since the programs covered areas which the teachers considered to be sources of frequent error to deaf students. One teacher was particularly pleased with the programs and prepared a program of approximately 200 frames on pronouns. She consented to delay the use of this program until the termination of the experimental period.

Teachers appeared to adjust readily to a weekly routine in distributing and collecting the programs.

Students were expected to write compositions and complete programs for homework. Students generally completed their assignments conscientiously. Some of the students in the day schools appeared to be receiving assistance at home both in writing compositions and completing programs. Where this was suspected, their teachers sent notes home urging parents to permit their children to work independently (Letters already had been sent to the parents of all the day school students in the experimental groups informing them of the investigation).

The investigators met with two classes in experimental group II to determine their attitude toward the programs after six months. Some of the more able students had become bored with the repetition of the programs, but most of the students seemed to have no objection to the repeated exposure. Most claimed that they had benefited from the programs but the sincerity of their statements could not be evaluated.

Students were quizzed orally by the investigators on specific rules. Some had memorized most of the rules in the programs.

One effect of the investigation mentioned frequently by both teachers and students was that students tended to proofread their compositions more carefully in order to correct errors before they were discovered by the teacher and programs assigned. Teachers of the deaf frequently indicate that most errors made by students could be corrected by the students themselves if they would read their own compositions critically before they presented them to the teacher for correction.

6. Classification of Grammatic Errors - Interpretation of the data in Table 12 is prefaced with the qualification that the composition score lacked high stability. However, it has also been indicated that little subjectivity attributable to the scorer was present in deriving composition scores.

Reference to Appendix C should be made in examing this Table. Thirty-one per cent of the errors were errors of clause order or meaning. This high percentage largely reflects the inadequacy of the scoring procedure in classifying certain errors more discretely, due to the unintelligibility of many sentences and compositions. To attempt to re-classify such errors could only result in increased subjectivity on the part of the scorer.

Excluding errors of order and meaning (due to unintelligibility), errors in the use of verbs are seen to occur most frequently, followed by errors in the use of nouns and pronouns, articles, prepositions, and conjunctions, in that order.

Three specific errors, again excluding errors of clause order and meaning, each accounted for over 5 per cent of the total errors.

Errors in the use of the correct tense of verbs accounted for 8.6 per cent, omission of the article accounted for 7.6 per cent, and errors in the singularity or plurality of common nouns accounted for 5.1 per cent.

Contrary to the expectation of the investigators, no errors were observed in the use of the negative of the verb. Only .1 per cent of the errors concerned the incorrect substitution of "a" and "an".

This classification would have greater significance if the frequency with which each grammatic construction is used, were known. For example, although 20.3 per cent of the errors involved the use of the verb, this is likely to be so because of the frequency with which verbs are used. By the same token, perhaps the reason no errors were observed in the use of the negative was that students rarely attempted to use the verb in the negative.

7. Skill in the Use of Grammar and Other Variables - Some indication of the validity of the two criteria, grammar test scores and composition scores, may be derived from Table 13. Both criteria correlate at the 1 per cent level of confidence with measures of intelligence and achievement. In each of four cases, the coefficients of concurrent validity are higher for the grammar test scores than for the composition scores.

Age in months correlates significantly with grammar test scores but not with composition scores. However, age at onset of deafness does not correlate significantly with grammar test scores while it does with composition scores.

The unexpectedly low correlation of age in months with performance by the two criteria suggests relatively little gain in language skill over the range of approximately seven years in age among the students of the sample. While not reported in Table 13, age was tested also for correlation with the grade achievement levels in reading, language, and overall achievement. Correlation coefficients of .354, .290, and .343 respectively were not high.

Intelligence quotients correlated higher with the above three variables (.386, .446, .487 respectively). It was of interest to note, however, that intelligence quotients and age showed a small but significant negative correlation (-.139). Partialling out intelligence quotients would therefore probably have increased the correlation between age and the two criteria and the other variables.

Another unexpected finding was the lack of relationship between severity of hearing loss and the two criteria. However, a supplementary calculation of the relationship between severity of hearing impairment and intelligence quotient revealed a significant positive correlation (.195) between the two. This is probably due to the fact that students with mild hearing impairments in schools for the deaf attend such schools rather than regular schools because of lower levels of mental ability than those who can successfully adjust to regular schools. This selective factor, then, may be responsible for the fact that there was no observed relationship between severity of hearing loss and performance by the two criteria.

B. Conclusions

The following three conclusions are drawn directly from the testing of the three original hypotheses:

1. The single presentation of language programs has no effect on the grammar of deaf adolescents.

2. The repeated presentations of the same language programs has a positive effect on the grammar of deaf adolescents not produced from the single presentation of language programs or from conventional instruction alone.

3. There is no significant difference between the effect of deductive and inductive forms of language programs on the grammar of deaf adolescents.

The following conclusions relate to the development and evaluation of an objective scoring procedure for the assessment of grammar in the written language of deaf adolescents.

4. Grammatic errors in written language can be isolated and counted by a scorer with objectivity, given a standard scoring procedure to follow.

5. Scores derived from the application of a scoring procedure are unstable over a period of five weeks when the content of compositions is not controlled.

6. Many grammatic errors in the compositions of deaf adolescents cannot be classified because of the unintelligibility of clauses.

7. Of errors which can be discretely classified, those involving the use of verbs are most frequent.

8. The three specific grammatic errors made with greatest frequency are: errors in verb tense, omission of the article, and errors in correct use of number with common nouns.

C. Implications for Immediate Practice

Programed instruction was demonstrated by the investigators in an earlier study to be an effective technique for establishing elements of written language in young deaf children. This investigation shows programed instruction to be similarly effective in correcting grammatic errors after they have been established. However, these errors appear to be highly resistent to extinction and only with repeated presentations of the programs is a significant improvement in grammar found.

So many errors are made in some clauses as to render them unintelligible. The basic problem may be one of syntax. It is unlikely that presently available language programs have the strength to convert unintelligible language into language which fulfills its intention, to communicate. Fortunately, relatively few students accounted for most errors. The problem for these students is probably more basic than can be met by remedial language instruction. In fact they may have never learned to communicate linguistically, and may really need the kind of initial teaching provided by other kinds of programs (Birch and Stuckless, 1962) or conventional first-teaching.

The repetition of presentations of language programs is probably necessary for deaf adolescent students because errors have become reinforced through repeated usage. This strongly suggests the importance of establishing correct language patterns early in the deaf child's linguistic development, if time, so important to the deaf, is to be used most effectively in language instruction.

It can only be surmised that, given carefully developed programed instruction skillfully timed by the teacher and incorporated into his total program of language instruction, deaf children will avoid many grammatic errors noted to be so frequent and so difficult to correct, in adolescence. In the meantime, the selective application of programed instruction, as followed by one group (experimental group II) in this investigation, should lead to a significant decrease in grammatic errors.

Information now available on the frequency with which certain errors recur (Table 12) suggests the errors for which programs can profitably be developed. For instance, the frequency with which errors in verb tense appear suggests this to be a worthwhile program to present to students repeatedly.

The indication that deductive and inductive forms of language programs are equally effective, plus the fact that the deductive forms are more easily developed, suggests that deductive forms only be employed. Language programs can be linear in design yet still have the adaptability typical of branching programs. The adaptability rises from the fact that a specific program can be presented to a student when he makes an error covered by that program. Another student can be presented with a program covering an error which he makes.

Perhaps one of the major implications of this investigation for immediate practice is the development of the composition scoring procedure. The major limitation of the composition score as a criterion used to test the hypotheses lay in its instability over time. This is thought by the investigators to be due to their not controlling the content of the language by controlling the stimulus (i.e., present theme, etc.). While this will be discussed more fully in recommendations for further research, the scoring procedure can now be used by the teacher for certain purposes as it stands.

The teacher has a method, in this procedure (Appendix C), for determining the major areas of weakness in a given class of students, and even of deriving an indication of specific weak areas of grammar for each student. The teacher is, however, urged to control the composition content. A class profile, similar in principle to Table 12, can be made, possibly in graph form. This will suggest areas where intense instruction is indicated, as well as areas which do not warrant emphasis.

The teacher is cautioned, however, against comparing composition scores of students over a period of time, hoping that this will indicate whether improvement in grammar has occurred. For the latter purpose, the grammar test score (Appendix B) is much better suited at present. This grammar test has been shown to be more stable over a period of time. This test has the necessary quality of sensitivity to gains in performance as shown by the fact that significant increases in scores were obtained by some students over a six-month period. In addition, although it was beyond the scope of this investigation to test it, this grammar test would appear superior to standardized language tests for the reason that it places emphasis on areas of particular difficulty to deaf students. Furthermore, it should not be difficult for the teacher sophisticated in test development and evaluation to develop alternate forms for this test since the subtests are well defined.

Considerable attention has been given to the immediate usefulness of the two criteria used in this investigation to the teacher. These methods of evaluation may prove useful diagnostic instruments.

Attention is drawn again to the demonstrated effectiveness of programed language instruction as a teaching technique. Programed instruction, coupled with conventional instruction, when skillfully and selectively applied by the teacher, can facilitate the correction and improvement in grammar of deaf students.

D. Recommendations for Further Research

It had been hoped before the outset of this investigation that conclusions could be based on the direct inspection of compositions. Because of the relative instability of this criterion, this could not be done. The instability of this criterion may be due to lack of control of the content of the compositions or to a number of other intervening variables. Because a grammar test was also employed, the hypotheses could still be tested. Obviously tests are generally employed where behavior, in this instance linguistic behavior, cannot be systematically directly observed and assessed.

Replication of this investigation is warranted at such time as the reliability of composition scores can be improved. In the meantime, the inference must be made that transfer takes place from information derived from the programs to language itself.

A second area unexplored by this investigation is the amount of transfer, if any, to vocalized language. Beyond this question, what relationship exists between the grammatic correctness of vocalized and written language?

Directly related to the effectiveness of programed instruction, the following researchable questions remain:

1. How many repetitions of the programs are necessary to extinguish errors?

2. Do the repeated presentations of programs have a differential effect on the student above and below the average level of skill in the correct use of grammar?

3. Would the deaf adult receive similar benefits from the repeated presentation of programs?

4. If the deductive and inductive forms are equally effective, could it be that students learn from the principles only, or from the examples only? Would removal of the frames giving the principles or rules, for instance, inhibit learning or not?

5. Would multiple-choice responses have been equal, less, or more effective in facilitating learning?

6. Does the fact that programs were presented in response to specific errors being made actually facilitate learning?

A scoring procedure was developed for this investigation because none was found in the literature to classify and count grammatic errors. Further research on such a procedure is strongly recommended. A reliable and valid scoring procedure will permit increased research in the language of deaf children, providing an instrument useful in evaluating current but untested methods as well as methods possibly not yet conceived.

While the investigators consider this procedure can now be profitably used for diagnostic purposes, further refinement is indicated both of the scoring procedure itself and of the conditions under which language samples are collected. Some further work has been initiated by the investigators in this area.

Information on the relative frequency of different classes of errors should generate some questions about their sources. Opponents of the use of manual signs for example often claim that many errors in written language are induced by the use of signs. It may be more than coincidence that errors in verb tense, omission of the article, etc., occur frequently. Persons who use signs generally do not directly indicate tense. Articles are rarely indicated. The adherents of signs, on the other hand, might respond by suggesting that suffixes indicating tenses of verbs and articles are not easily read on the lips and for this reason are not written. Do the written errors in grammar made by "oral" and by "manual" children differ?

The results of this and an earlier investigation (Birch and Stuckless, 1962) strongly support the feasibility of programing language for both younger and older deaf students. It remains for longitudinal demonstration to determine the magnitude of the influence of programed language instruction in the hands of the skilled teacher of the deaf.

VII. SUMMARY

This investigation determined the relative remedial effect of single and repeated presentations of programed instruction added to conventional instruction, and of conventional instruction alone, on the grammar of deaf adolescents.

The repeated presentation of the same programs added to conventional instruction was found to produce a superior effect. Deductive and inductive forms of the programs were found to be equally effective in improving grammar.

A grammar test and a procedure for scoring compositions directly on the basis of grammar were developed. Grammatic errors in compositions written by 214 deaf adolescents were counted and classified according to a scoring procedure.

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APPENDIX A

Description of Content of Ten Programs

1. Verb tenses. This program identifies verbs in sentences and indicates that every verb is temporal. The formation of past, present, and future tenses of regular verbs is shown. Fourteen irregular verbs were observed to be a source of frequent error in the preliminary analysis and these are conjugated in the program (65 frames).

2. Verb agreement. The suffix of the verb in the present tense is shown to be dependent upon its subject. The irregular suffixes on verbs in the third person singular are shown, ie., "es", "ies." Suffixes of verbs in the present tense are shown to commonly be added when accompanying a third person, singular pronoun subject (43 frames).

3. "To be" and "to have". These verbs are shown as linking words, with "to have" frequently implying possession. Rules covering "have, has, had, was, were, an, are, is" are introduced (67 frames).

4. Subject and verb omission. This program indicates that a general rule is that every clause must have both a subject and a verb, that the subject typically precedes the verb, and that the verb tells something about the subject (45 frames).

5. Auxiliary verbs. This program reasserts that all main verbs must show tense, and that the copulative verb "to be", added to the main verb, is often required to form tense. Past progressive, present progressive, and future progressive tenses are formed by the addition of a form of "to be" to the active participle (49 frames).

6. Infinitives. The formation of the infinitive is described, together with its usual position in the sentence succeeding the main verb (52 frames).

7. Articles. Rules covering the general use of "a", "an", and "the" are given. The program covers rules helpful in determining whether "the" should precede proper nouns, and the use of articles with"few", "lot", "lots" (64 frames).

8. Prepositions. Numerous prepositions of place and of time are discussed. Pictures illustrate the use of five prepositions of place. The prepositions "with" and "for" are also introduced (60 frames).

9. Conjunctions. The use of "and, but, so, because, if, when" is introduced. Limitations on beginning a sentence with a conjunction are given (40 frames).

10. Noun number. This program defines a noun, and shows how singular and plural nouns are formed, including those which end in "es" and "ies". "Few, some, many, dozen" are shown to require plural nouns. "Food, fish, hair" are considered singular. "Pants, upstairs, downstairs, outdoors, indoors" end in "s" (46 frames).

APPENDIX B

Grammar Test

Name ______________________
Date ______________________

TEST

A. Write the correct verb.

1. I ______home last Friday (go)
2. Tom ______to the store tomorrow. (run)
3. Dale ______a newspaper last night (buy)
4. The girls ______in the bus last month. (ride)
5. Susan ______dinner at 6:00 tomorrow night. (eat)

B. Write the verb in the Present Tense.

6. Mary ______her clothes. (wash)
7. John ______to the store tomorrow. (run)
8. The baby ______all the time. (cry)
9. Jack ______to school in the morning. (hurry)
10. The boys ______baseball every Friday. (play)

C. Write the correct form of the verb "to be" or "to have".

11. I ______tired now.
12. John ______a cold last week.
13. The girls ______singing last night.
14. We ______a party next week.
15. Sam ______excited at the game yesterday.

D. Write the verbs for these sentences.

VERB

16. The girls had a party last night. ______________
17. Mr. Frederick drove his car to work. ______________
18. Sandy broke her doll. ______________
19. Jimmy walked to the store. ______________
20. Mike threw the ball. ______________

E. Put the correct auxiliary verb ("am, is, are, was, were, will") in the sentence.

Example: Mary$\overset{\text{is}}{\wedge}$learning to type this year.

21. We see a movie tomorrow.

22. Tom running outside last night.

23. The girls sewing their skirts now.

24. Frank making a table in the shop now.

25. The boy go to town next Saturday.

F. Put the infinitive (to ______) in the sentence.

Example: "She likes$\overset{\text{to play}}{\wedge}$volleyball." (play)

26. I want home. (go)

27. The girls like. (sew)

28. I want a letter to my friend. (write)

29. We tried the game. (win)

30. Marty went his family. (see)

G. Put the correct article (a, an, the) in the sentence.

Example: $\overset{\text{A}}{\wedge}$ Spider has many legs.

31. John has orange.

32. I saw movie last night.

33. We visited Empire State Building.

34. I have never seen Mississippi River.

35. Bob is nice boy.

H. Put the correct preposition ("in, on, under, to, from, for, with") in the sentence.

Example: He wrapped the toy$\overset{\text{in}}{\wedge}$a box.

36. Bob went the store.

37. Judy went to the store some bread.

38. Betty went to the movie Bob.

39. The food was the table.

40. Jack sat the room.

I. Correct the sentence.

Example: Wh~~e~~n Jack and John bought a watermelon.

41. Jack Bill will go home tomorrow.

42. I wanted to go to town, it was raining.

43. I ran I was late.

44. Bill was tired, he went to bed.

45. When I was little, and I had red hair.

J. Write the correct noun.

46. We had lots of ______ to eat. (food)

47. I bought two ______. (brush)

48. Jack got one ______ for his birthday. (dollar)

49. Joe has three ______. (puppy)

50. Harold ate some ______. (apple)

Directions: Correct any mistake you find, but do not change the meaning.

Example: Fred ~~go~~ went to a movie last night. It was a good movie. He w~~a~~s had a good time.

The Party

Joe and Donna have a party last night. They play many games on their house. They wanted have fun. They sitting on some chairs. Then they ate some foods. They were full but they ate too much ice cream. They chocolate milk. They had good time.

All people like to have parties. Donna like to have parties.

Jack Roach

Jack is good student. He like read. He is many books at home. He studying to go college in two year. He write a test next week. John must work hard. We all must hard and we want to learn.

APPENDIX C

Rules for classifying and scoring grammatic errors in compositions, with examples taken from compositions collected in the investigation.

Category and condition for counting one (1) error	Examples of usage
1. Verbs	
a. tense - tense inappropriate in general context.	1. She is 16 years old in April. 2. We talked and drink pop.
b. agreement - noun is correct number, but verb not in agreement. - if noun incorrect number, but verb in agreement, score as error of 5a or 5b.	1. I loves stars. 2. There was more than one thousand people there. 3. Some of the visitors comes here. 4. Susie never eat vegetables.
c. omission - main verb and/or auxiliary omitted.	1. We drove to Frontiertown where the Wild West. 2. What the matter with her? 3. My favorite sport basketball.
d. addition - verb form should not be used.	1. When I get graduate. 2. We went to go see the flower show. 3. Bob took me go to the game. 4. Who was won?
e. "be" and "have" - incorrectly interchanged.	1. We were a full car. 2. My sister had a beauty queen. 3. There had a reunion for all deaf people. 4. I had no vacation like the boys and girls were.

f. voice - incorrect.	1. We are exciting to hear. 2. It was thrilled. 3. We were very interesting to visit there.
g. auxiliary - incorrectly added, omitted or formed. - priority over 1a.	1. Yesterday I would come back to school for open house. 2. I been here for three years. 3. I was cried hard. 4. I (will) never forget.
h. infinitive - required or incorrectly formed.	1. He wanted to going into the motel. 2. The boys learning how to swimming. 3. The story made them sick to heard.
i. verbal - required or incorrectly formed.	1. We enjoy to have cookouts. 2. I bought a new license for duck (hunting).
j. negative - incorrect formation - takes priority over all other rules for scoring.	1. He did not seen the car. 2. She not will go home.
k. conjugation - awareness of tense but incorrect conjugation.	1. I done it. 2. I readed some books. 3. Williams stealed a ball from Steve.
2. Articles	
a. substitution - incorrect article.	1. A (the) old vacuum was very old. 2. The school has the pool.

b. omission - article is omitted.
   1. I want to become teacher.
   2. She bought lot of presents.
   3. We had very wonderful time.
   4. My parents went to visit School for the Deaf.

c. addition - article should be omitted.
   1. I went home the after school.
   2. He was a very rich.
   3. My family went to the town.
   4. I was a born in Wisconsin.

d. "an" and "a" - one used in place of other incorrectly.
   - takes priority over 2a.
   1. There was a open house in our new school.
   2. I wanted to walk on a old log.
   3. We had an sixteen pound turkey.

3. Prepositions

a. substitution - incorrect preposition.
   1. Father drove the car in the highway.
   2. I stayed on bed.

b. omission - preposition omitted from phrase.
   1. I want to be a director physical education.
   2. I did not go school.
   3. My relatives came over my house.

c. addition - preposition inappropriately added
   1. In four years ago I travelled.
   2. I visited to Fort Ticonderoga.
   3. They played against with the Giants.
   4. Now they are in a full game behind them.
   5. We went to home.

4. Conjunctions
   - a. addition - conjunction inappropriately added
     1. They are comical and etc.
     2. If there's great trouble in the world.
     3. Because the duck did not come.
     4. When I came to my dormitory. and I saw many little girls.
   - b. substitution - incorrect conjunction.
     1. We played several games as (that) we enjoy.
     2. I will miss my school life that (because) I've had many memories.
   - c. omission - if clauses are not separated by period, and conjunction can apply.
     1. We went looked for more.
     2. One of the New England states is Maine, my uncle's nephew lives there.

5. Nouns and pronouns
   - a. common noun number - incorrectly pluralized or should be singular.
     1. My favorite hobbies is taking a trip.
     2. My cousin's name are Frank and Robert.
     3. We went to the wood.
     4. She taught me each lessons.
   - b. irregular noun number - incorrectly pluralized or should be singular.
     1. My father had some moneys.
     2. The Packers defense lineman are the most powerful.
     3. They went hunting for deers.
   - c. omission - noun or pronoun inappropriately deleted.
     1. One of the New England is Maine.
     2. They had a great of fun.
     3. The Lions won and (we) cheered.

d. addition - noun or pronoun inappropriately added.	1. His hand has an infection hand.
e. pronoun substitution - wrong pronoun used.	1. We (they) took me to school.
f. possessive - error of - takes priority over 5c, 5d, 5e	1. The boys and girls changed into our costumes. 2. They laughed about my's deafness. 3. I went to my girlfriend house. 4. Our six boys and I fixed a car.

6. Order and Meaning

a. single word - out of place, inappropriate, or two words interchanged.	1. It was outdoors fine. 2. We drove the bridge across to New York. 3. My all family will come over.
b. phrase - phrase internally correct but out of order in sentence or meaningless in content.	1. In school we came to school on October 21. 2. Our neighbors with us went to the fairgrounds.
c. clause - unintelligible without inference. To determine number of errors, use $\frac{\text{number of words}}{2}$ (round off to smaller whole number)	1. It will finish come vacation last week (counts as 3 errors).

7. Unclassified

General Rules:

1. If the error is one of substitution and if another word which is the same part of speech or has the same function should be substituted for the word found in the composition, this is considered as 1 error; if a different part of speech should be substituted, this is considered as 2 errors (1 addition, 1 omission).

2. If several internally correct words or phrases should be dropped to make the sentence syntactically correct, errors should be determined as $\frac{\text{number of words dropped}}{2}$, rounding off to the smaller whole number.

3. No total errors should exceed one-half the total words in the composition. Similarly, no total errors in a given sentence should exceed one-half the total words in the sentence. Classify under 6c.

4. If uncertainty remains as to whether the sentence is syntactically correct, consider as correct. If syntactically incorrect by conventional standards but of relatively common idiomatic usage, consider as correct.

5. Disregard titles, spelling and punctuation except for 4c.

APPENDIX D

One of 10 programs developed for the purpose of correcting grammatic errors in the language of deaf adolescent students (Deductive Program)

To the student:

You have made a mistake in language. This book will help you correct your mistake. You must follow the directions if you wish to improve your language. You do not read down the pages in this book; instead, you read across the book.

Directions:

1. Take a sheet of lined paper for writing your answers.
2. Read frame #1, under QUESTION.
3. Write the missing word or words on the lined paper.
4. Turn the page of the book and read the correct answer, under ANSWER.
5. If your answer is correct, write ✓ beside your answer. If your answer is not correct, write × beside your answer.
6. Read frame #2 on the same page and follow steps 3, 4, and 5 again.
7. When you finish the last page, start on the next frame on the first page again.

Do Not Cheat. (Do not read the correct answer until after you write your answer).

After you finish this program, correct your language mistake. Try to remember what you learned so you do not make the same mistake in your language again.

ANSWER	QUESTION
	1. A verb is a word that shows action. Verbs show a-----.
11. past present future	12. "__________, _________, ________", are verb tenses.
22. helped kissed worked	23. "I (walk) to school" is "I walked to school" in the past tense. Write this sentence in the past tense: John (learn) to read last year.
33. future tense future tense	34. "______look" is future tense. "______play" is future tense. Write "talk" in the future tense. ______ ______
44. came rode	45. Past "ate" "ran" Present "eat" "run" Future "will eat" "will run" Write the verbs in the past tense: I (eat) bacon and eggs for breakfast. John (run) to see his friends.
55. went, saw, bought, rode, ate, left	56. Write all the verbs in the past tense: Some girls (try) to play baseball last week. They (find) an old ball and bat. One of the girls hit the ball. She (run) very fast. She (get) tired. My team (win) the game.

1. action	2. "Run, jump, throw, hit" are verbs. "Run, jump, throw, hit" show action. "Run, jump, throw, hit" are v---s. "Run, jump, throw, hit" show a-----. Verbs show a-----.
12. past present future	13. Past Present Future "Walked walk will walk" are verb tenses. "Learned learn will learn" are verb tenses. "Wanted want will want" are v--- t-----.
23. John learned to read last year.	24. Write the verbs in the past tense. Mary (want) to go home last Friday. I (like) to play with dolls when I was a baby. The dentist (look) at my teeth last week.
34. will will will talk	35. Write these verbs in the future tense. help, kiss, work. ________ ________ ________ ________ ________ ________
45. ate ran	46. Past Present Future "won" "win" "will win" "found" "find" "will find" Write the verbs in the past tense: Our team (win) in the basketball game. Susan (find) a dime on the sidewalk.
56. tried found ran got won	57. Write all the verbs in the past tense: My mother (wake) me up this morning. She (come) to my room. I (get) dressed. Mother (give) me breakfast. I (eat) everything. I (go) to school. I (ride) in the car. Mother (buy) gas for the car. I (run) to school.

2. verbs action action	3. "Paper, horse, dog, table" are not verbs. "Paper, horse, dog, table" do ____ show action.
13. verb tenses	14. Past Present Future " ______ like will like" are verb tenses. "looked ______ will look" are verb tenses. "played play ______ ______" are verb tenses. "lived ______ ______ ______"are verb tenses.
24. wanted liked looked	25. Write the verbs in the past tense. We play ball. The teachers talk to the class. I wait a long time for a bus.
35. will help will kiss will work	36. "I (walk) to school" is "I will walk to school" in the future tense. Write this sentence in the future tense: John (learn) to read next year.
46. won found	47. Past Present Future "gave" "give" "will give" "tried" "try" "will try" Write the verbs in the past tense: Frank (give) his sister some candy. The little boy (try) to help his father.
57. woke, came, got gave, ate, went rode, bought, ran	58. Write the two words that show action and are verbs. "Run, cow, play, man." __________

3. not	4. Write the two words that show action and are verbs. Horse, throw, sit, table. ________ ________
14. liked look will play live will live	15." ______ talk " are verb tenses. " ______ ______ will wait" are verb tenses. " ______ stay ______ " are verb tenses. "watched ______ ______ ______" are verb tenses.
25. played talked waited	26. When we use words in a sentence like: yesterday last night a month ago last week we usually use the past tense.
36. John will learn to read next year.	37. Write these verbs in the future tense: Perhaps Mary (want) to go to a movie next Friday. The dentist (look) at my teeth next week. We (play) basketball next Friday.
47. gave tried	48. Past Present Future "woke" "wake" "will wake" "bought" "buy" "will buy" Write the verbs in the past tense: I (wake) up at 7:00 this morning. Jack (buy) some apples at the store.
58. run play	59. A verb's time is called t---e.

4. throw sit	5. Verbs always show time. Verbs always show t---.
15. talked will talk waited wait stayed will stay watch will watch	16. "____ help " are v--- t-----. "____ ____ will kiss" are ____ ____. "Worked ____ ____ ____" are ____ ____.
	27. These sentences are not correct. Change the verbs. I stay at camp last week. I watch T.V. last night. John help his father in the garage yesterday.
37. will want will look will play	38. Write these verbs in the future tense: The men talk to the soldiers. I wait a long time for a bus.
48. woke bought	49. Write the past tense: Past Present Future ____ "ride" "will ride" ____ "eat" "will eat" ____ "run" "will run" ____ "win" "will win" ____ "find "will find"
59. tense	60. Three tenses are: "P---, p------, and f-----.

5. time

6. Verbs always show "when".
Verbs _____ show "w---".

---

16. helped will help
verb tenses
kissed kiss
verb tenses
work will work
verb tenses

RULE 2.
17. The past tense shows that an action is finished.
The past tense shows "before".

When an action is finished, we use the p--- tense.

---

27. stayed
watched
helped

28. These sentences are not correct. Change the verbs.

My mother kiss me last night.
Betty work in a drug store last summer.

---

38. will talk
will wait

39. When we use words in a sentence like:
next week
tomorrow
tonight
in two months
we usually use the future tense.

---

49. rode
ate
ran
won
found

50. Write the past tense:

Past	Present	Future
_____	"come"	"will come"
_____	"go"	"will go"
_____	"get"	"will get"
_____	"see"	"will see"
_____	"leave"	"will leave"

---

60. past
present
future

61. Past Present Future

_____ walk _____ are verb tenses.

<table>
<tr><td>6. always
when</td><td>7. A verb's time is called "tense".
"Tense" shows "when".

T---- is a verb's time.</td></tr>
<tr><td>17. past</td><td>18. Many verbs end in "ed" in the past tense.

Many past tenses of verbs end in "__".</td></tr>
<tr><td>28. kissed
worked</td><td>RULE 1.
29. The present tense shows action now.

When an action shows now, we use the p-----t tense.</td></tr>
<tr><td></td><td>40. These sentences are not correct. Change the verbs.

I stay at school next week.
I watch T.V. tomorrow.
John help his father in the garage next Monday.</td></tr>
<tr><td>50. came
went
got
saw
left</td><td>51. Write the past tense:
<table>
<tr><th>Past</th><th>Present</th><th>Future</th></tr>
<tr><td></td><td>"give"</td><td>"will give"</td></tr>
<tr><td>______</td><td>"try"</td><td>"will try"</td></tr>
<tr><td>______</td><td>"wake"</td><td>"will wake"</td></tr>
<tr><td>______</td><td>"buy"</td><td>"will buy"</td></tr>
<tr><td>______</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>61. walked
will walk</td><td>62. "Asked" is ________ tense.
"Push" is ________ tense.
"Will start" is ________ tense.</td></tr>
</table>

7. tense

RULE 1.

8. Verbs always have tense.

All verbs have -----.

---

18. "ed"

19. "Walked" is past tense.
"Learned" is past tense.

"Wanted" is _____ _____.
"Liked" is _____ _____.

---

29. present

30. "Walk" is present tense.
"Learn" is present tense.

Want" is _____ _____.
"Like" is _____ _____.

---

40. will stay
will watch
will help

RULE 5.

41. We know that most words end with "ed" in the past tense, but some words in the past tense do not end with "ed". Some words are made differently in the past tense.

---

51. gave
tried
woke
bought

52. Fill in the blanks:

Past	Present	Future
came	come	will come
went	go	will go
got	get	_____
_____	see	will see
left	_____	will leave

---

62. past
present
future

63. When an action is finished, we use the p--- tense.
When an action shows now, we use the p------ tense.
When an action shows after a while, we use the f----- t----.

8. tense	9. A verb tense shows t--- or w---.
19. past tense past tense	20. "Look--" is past tense. "Play--" is past tense. Write "talk" in the past tense. t----d
30. present tense present tense	31. Write "looked" in the present tense: ---- Write "played" in the present tense: ----
	42. Past — Present — Future "went" — "go" — "will go" are verb tenses. "got" — "get" — "will get"are verb tenses. Write the verbs in the past tense: I (go) to the movies last night. Mary (get) a new sweater for her birthday.
52. will get saw leave	53. Fill in the blanks: Past — Present — Future ____ — ride — will ride ____ — eat — will eat ran — run — ____ won — ____ — will win ____ — find — will find
63. past present future tense	64. Write the past, present and future tenses of these verbs: Past — Present — Future ____ — ____ — ____ (taste) ____ — ____ — ____ (help) ____ — ____ — ____ (talk)

9. time
when

10. A verb tense may be "past, present, or future."

"Past, present, and future" are verb t----s.

---

20. looked
played
talked

21. Write these verbs in the past tense.

"Wait, stay, watch, live."

----ed
____
____
____

---

31. look
play

RULE 4.
32. The future tense shows action after a while.

When an action shows after a while, we use the f----e tense.

---

42. went
got

43.

Past	Present	Future
"saw"	"see"	"will see"
"left"	"leave"	"will leave"

Write the verbs in the past tense:

We (see) an exciting game last week.
The boys (leave) their house early in the morning.

---

53. rode
ate
will run
win
found

54. Fill in the blanks:

Past	Present	Future
	give	will give
tried	____	____
____	wake	____
____	____	will buy.

---

64. tasted taste
will taste
helped help
will help
talked talk
will talk

65. Write the past, present, and future tenses of these verbs.

Past	Present	Future	
____	____	____	(come)
____	____	____	(go)
____	____	____	(get)

10. tenses	11. Three verb tenses are "P---, p------, f-----". (Return to the first page)
21. waited stayed watched lived	22. Write these verbs in the past tense. "Help, kiss, work." ________ ________ ________
32. future	33. "Will walk" is future tense. "Will learn" is future tense. "Will want" is ______ ______. "Will like" is ______ ______.
43. saw left	44. Past Present Future "came" "come" "will come" "rode" "ride" "will ride" Write the verbs in the past tense: My friends (come) to visit me yesterday. I (ride) a big white horse last summer.
54. gave try, will try woke, will wake bought, buy	55. Write all the verbs in the past tense: We (go) to Washington, D. C. last year. We (see) many things there. We (buy) magazines and (ride) on the bus. We stopped and (eat) dinner. Then the bus (leave).
65. came come will come went go will go got get will get	